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A NEW SPECIES OF *XENUROBRYCON* (TELEOSTEI: CHARACIDAE) FROM THE RÍO MAMORÉ BASIN OF BOLIVIA

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Abstract.—*Xenurobrycon polyancistrus,* a new species of characid fish of the subfamily Glandulocaudinae, is described from the Río Mamoré and Río Isiboro of Bolivia. The new species is distinguished from *Xenurobrycon macropus, X. pteropus,* and *X. heterodon* by several characters outlined in the key and text. The geographic range of the new species lies between that of *X. macropus* to the southeast in the Río Paraná–Río Paraguay basins, that of *X. heterodon* to the northwest in the Río Ucayali–Río Huallaga basins, and that of *X. pteropus* to the north in the Rio Solimoẽs at Fonte Boa. The fish was taken from savannah areas in gallery forest pools adjacent to rivers.

Among a small collection of fishes from Bolivia recently sent by Gérard Loubens of the Office de la Recherche Scientifique et Technique Outre-Mer, Laboratoire d'Ichthyologie de l'Université de Trinidad, Estado Beni, Bolivia to the Smithsonian Institution for identification was a new species of *Xenurobrycon* Myers and Miranda-Ribeiro (1945:2). The three known species of *Xenurobrycon, X. macropus* Myers and Miranda-Ribeiro, *X. pteropus* Weitzman and Fink, and *X. heterodon* Weitzman and Fink, were treated in detail by Weitzman and Fink (1985:74–93). They attempted no phylogenetic analysis of these species pending a review and phylogentic analysis of the species in the related outgroup genera *Tyttocharax* Fowler (1913:563) and *Scopaeocharax* Weitzman and Fink (1985:56). No such analysis is attempted here for the same reason; however, the new species does appear most closely related to *X. pteropus* on the basis of the particular form and distribution of the derived anal-fin hooks shared by the males of these two species.

Methods and Materials

Counts and measurements recorded are as described by Fink and Weitzman (1974: 1–2). Body depth is measured vertically from dorsal-fin origin. All measurements other than standard length (SL) are expressed as a percentage of SL except subunits of the head which are recorded as a percentage of the head length. Total vertebral counts, taken from radiographs and from two cleared, Alizarin and Alcian blue stained specimens, include all vertebrae of the Weberian apparatus, and with the fused $PU_1 + U_1$ of the caudal skeleton counted as one vertebra. In the text and table, the count or morphometric character given first is of the holotype. The next series of figures is for ranges and means of all specimens which are represented by one set of figures for both the males and the females except in cases of sexual dimorphism in which this information is given by sex. Specimens examined for this study are deposited in Muséum National d'Histoire Naturelle, Paris (MNHN) and National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM).

Artificial Key to Species of *Xenurobrycon* Myers and Miranda-Ribeiro

1. Jaw teeth unicuspid, bicuspid, and tricuspid; anterior, large teeth of

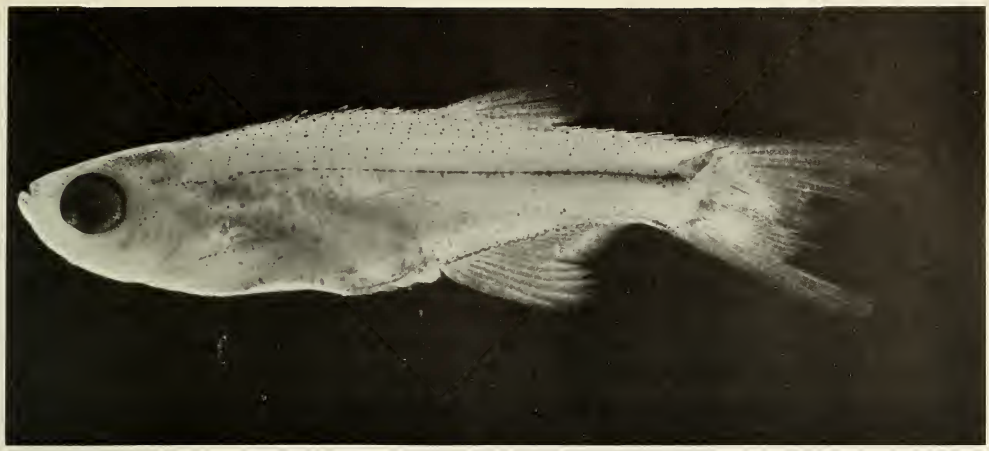

Fig. 1. *Xenurobrycon polyancistrus,* new species, holotype, MNHN 1986-452, male SL 13.1 mm, Río Isiboro, Laguna Motacusal, Estado Beni, Bolivia, 1 Nov 1985.

lower jaw especially likely to be tricuspid; pouch scale in sexually mature males approximately tear-drop shaped with posterior process elongate and terminating in a relatively acute angle . . . *Xenurobrycon heterodon*

– Jaw teeth all conical, without secondary cusps; posterior process of pouch scale in sexually mature males either elongate or short; when elongate, either bluntly or acutely terminated 2

2. Mature males with semicircular flange-like process on principal caudal-fin ray 18; sexually mature males with posterior anal-fin ray hooks slender, no larger than anterior hooks ..... *Xenurobrycon macropus*

– Mature males without semicircular flange-like process on principal caudal-fin ray 18; sexually mature males usually with posterior principal anal-fin rays with hooks larger than those on anterior rays 3

3. Adipose fin present; pouch scale with acutely concave posteroventral border and posterior area of scale formed into modestly elongate but bluntly terminated process .... *Xenurobrycon pteropus*

– Adipose fin absent; pouch scale with posteroventral border nearly straight, not acutely angled or concave, pouch scale teardrop shaped with posterior process relatively acute ..... *Xenurobrycon polyancistrus*

Xenurobrycon polyancistrus,
new species
Figs. 1–3, Table 1

Holotype.—MNHN 1986-452, male, SL 13.1 mm, Bolivia, Estado Beni, Laguna Motacusal, Río Isiboro, about 15°40′S, 65°00′W, 1 Nov 1985, L. Lauzanne, G. Loubens.

Paratypes.—MNHN 1986-453, 1 male, 5 females, SL 11.3–12.9 mm.—USNM 278191, 3 males, 2 females, SL 12.1–13.8 mm.—USNM 278188, 1 male, 1 female, (cleared and stained) SL 12.5–13.0 mm. All preceding paratypes with same collection data as holotype.—USNM 278190, 1 male, 1 female, 2 immatures, SL 11.0–11.8 mm, Bolivia, Estado Beni, Laguna Santa Rosa, Río Mamoré near Trinidad, about 14°47′S, 64°41′W, 21 Sep 1983, L. Lauzanne, G. Loubens.

Diagnosis.—Distinguished from all other species of *Xenurobrycon* by having a com-

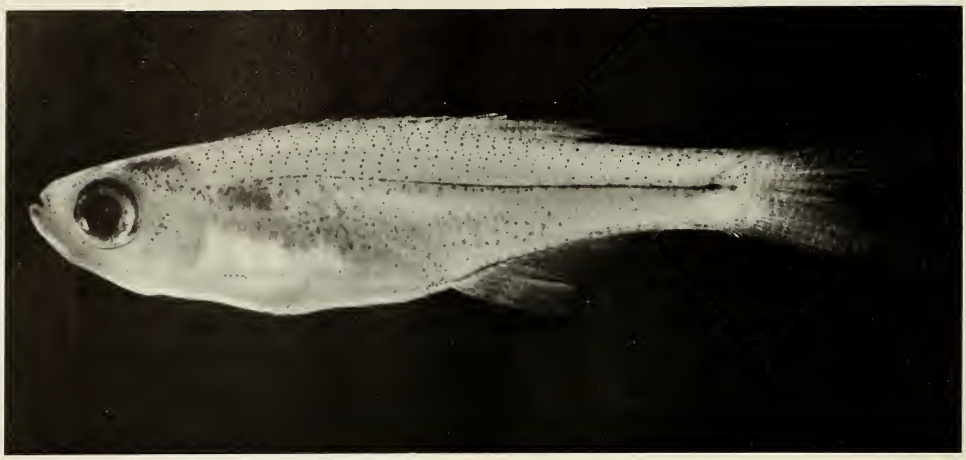

Fig. 2. *Xenurobrycon polyancistrus,* new species, paratype, USNM 278191, female SL 13.8 mm, Río Isiboro, Laguna Motacusal, Estado Beni, Bolivia, 1 Nov 1985.

bination of unicuspid teeth, no adipose fin, hooks absent on posterior 3 or 4 anal-fin rays, teardrop-shaped profile of pouch scale, and no semicircular flange on principal caudal-fin ray 18. Most sexually mature males with hooks on posterior of anal fin distinctly larger than those on anterior of fin. Comparison of Table 1 with Tables 1–4 in Weitzman and Fink (1985:78–80, 86, 90, 91) show some ratios possibly distinguishing *X. polyancistrus* from previously described species. Since specimens of *X. polyancistrus* and *X. pteropus* too few for meaningful statistical analysis, these possible differences mostly omitted here. Upper jaw length possibly significantly different. *Xenurobrycon polyancistrus* with upper jaw ratio of between 20 and 29 percent of head length; other species with jaw to head ratio of 27 to 36 percent of head length, usually above 30 percent. Anal-fin hooks distributed differently than in two other species of *Xenurobrycon.* See description below.

Description.—See Table 1 for morphometric values. Body moderately elongate, sides compressed. Greatest depth usually about midway between nape and dorsal-fin origin. Predorsal body profile gently convex to snout tip. Body profile slightly, if at all, elevated at dorsal-fin origin, slightly concave along dorsal-fin base, and nearly straight to slightly concave to origin of dorsal procurrent caudal-fin rays. Dorsal-fin origin nearer to caudal-fin base than to snout tip. Ventral body profile gently convex from anterior of lower jaw tip to pelvic-fin origin, somewhat concave in region of pelvic-fin insertion. Body profile between pelvic-fin insertion and anal-fin origin somewhat concave to convex in both sexes. Body profile concave along anal-fin base and nearly stright posteriorly to origin of ventral procurrent caudal-fin rays.

Head and snout moderately elongate. Lower jaw protruding anterior to upper jaw. Mouth angled anteroventrally from snout tip to posterior mandibular joint. Maxilla extending posteriorly to point anterior of vertical line drawn through anterior border of eye.

Dorsal-fin rays ii, 7 (ii, 6, n = 2; ii, 7, n = 16; $\bar{x}$ = 6.9 for branched rays, n = 18); posterior ray not split to its base. Adipose fin absent. Anal-fin rays iii, 13 (iii, 12, n = 4, iii, 13, n = 13; iii, 14, n = 1; $\bar{x}$ = 12.8, n = 18); posterior ray split to its base. Anal fin with strongly lobed anterior portion in males, lobe less developed in females. Compare Figs. 1 and 2 and Table 1. Anal fin of

Table 1.—Morphometrics of *Xenurobrycon polyancistrus*. Separate entries for males and females are provided for sexually dimorphic characters.

		Laguna Motacusal				Laguna Santa Rosa		
		Holotype	n	Range	Mean	n	Range	Mean
Standard length (mm)		13.1	14	11.3–13.1		4	11.0–11.6	
		Percentage of standard length						
Greatest body depth		28.2	14	23.9–30.2	26.7	4	25.5–31.4	27.6
Depth at dorsal-fin origin		23.7	14	23.7–25.8	24.1	4	24.5–28.0	25.5
Snout to dorsal-fin orgin		61.1	14	59.2–63.2	60.9	4	61.2–64.5	62.8
Snout to pectoral-fin origin		26.7	14	25.2–28.4	27.2	4	26.4–29.1	28.1
Snout to pelvic-fin origin	m	36.6	6	35.7–38.9	36.7	1	37.3	
Snout to pelvic-fin origin	f	—	8	43.6–47.0	45.1	3	44.8–48.2	46.0
Snout to anal-fin origin		61.8	14	58.5–63.5	61.2	4	58.5–63.6	61.4
Caudal peduncle depth	m	13.7	6	12.7–14.0	13.2	1	13.6	
Caudal peduncle depth	f	—	8	10.4–12.4	11.7	3	12.0–12.7	12.3
Caudal peduncle length		20.6	14	19.7–23.2	21.2	4	20.0–22.0	21.0
Pectoral-fin length		21.4	14	19.1–22.5	21.0	4	20.7–25.4	22.0
Pelvic-fin length	m	37.4	6	33.3–41.5	38.4	1	39.0	
Pelvic-fin length	f	—	8	11.1–13.0	12.0	3	10.9–15.5	12.7
Dorsal-fin base length		9.2	14	7.7–9.2	8.5	4	8.0–10.3	9.6
Longest dorsal-fin ray		22.1	14	20.7–24.0	22.1	4	20.9–22.5	21.7
Anal-fin base length		19.8	14	19.8–22.3	21.1	4	20.3–20.9	20.6
Anal-fin lobe length	m	24.4	6	24.4–27.2	25.4	1	26.3	
Anal-fin lobe length	f	—	8	19.4–21.2	20.7	3	20.7–20.9	20.5
Bony head length		23.7	14	23.6–26.9	25.2	4	23.7–25.5	24.9
		Percentage of bony head length						
Horizontal eye diameter		41.9	14	35.9–41.9	38.8	4	41.4–42.9	42.5
Snout length		21.9	14	19.7–21.9	20.2	4	20.7–21.4	21.1
Least width interorbital		38.7	14	34.4–39.4	36.1	4	42.9–46.2	44.2
Upper jaw length		32.3	14	20.3–32.3	25.2	4	25.7–28.6	26.8

sexually mature males with bilateral antrorse bony hooks, usually one hook per fin-ray segment. Anterior rays with largest number of hooks; progressively fewer hooks posteriorly. Hooks arranged as follows, in two morphological groups. Anterior first large unbranched ray and first 4 branched rays with largest number of medium-sized hooks, similar to those of *X. macropus*; see Weitzman and Fink (1985:31, fig. 42). Hooks on third anterior unbranched ray 5 (5–8, $\bar{x} = 6.2$, n = 6). Hooks on first anterior branched ray 5 (4–8, $\bar{x} = 6.3$, n = 6); one specimen (holotype) with 2 hooks on each of 2 distal segments. Hooks on second branched ray 5 (4–7, $\bar{x} = 5.3$, n = 6); one specimen (holotype) with 2 hooks on distal ray segment. Hooks on third branched ray 4 (3–6, $\bar{x} = 4.5$, n = 6). Hooks on fourth branched ray 3 (1–5, $\bar{x} = 2.8$, n = 6). Hooks on fifth branched ray 1 (1–2, $\bar{x} = 1.2$, n = 6). Hooks on sixth branched ray 1 (1–2, $\bar{x} = 1.2$, n = 5). Branched rays 7 to 10 with 1 hook per ray in 5 specimens including holotype. Ray 11 with 1 hook in 3 specimens. All 6 males without hooks on rays 12, 13, or 14 (latter 1 or 2 rays may be absent). Posterior hooks large in all but one specimen, similar to those on branched rays 8 to 11 of *X. pteropus,* Weitzman and Fink (1985:31, fig. 43). Large hooks on sixth branched ray in 2 specimens, and large on all specimens (including holotype) on branched rays 7 to 10. Hook, when present, large on ray 11.

Pectoral-fin rays i, 7 in all specimens. Dis-

Fig. 3. *Xenurobrycon polyancistrus,* new species, pouch scale from paratype, USNM 278191, male, SL 13.0 mm, Río Isiboro, Laguna Motacusal, Estado Beni, Bolivia, 1 Nov 1985. Lateral view, left side.

tal tips of pectoral-fin rays extending posterior to pelvic-fin origin in females and well beyond that point in males due to anterior position of pelvic-fin origin in males. See Table 1 for comparison of ratios of pelvic-fin origin in males and females. Pectoral-fin length about equal in both sexes.

Pelvic-fin rays vii in all specimens except cleared and stained male in which second ray of left side branched distally. Pelvic fin sexually dimorphic, elongate in males. Compare ratios of male and female pelvic-fin lengths in Table 1. Pelvic fin of males arched, with interradial membranes extensive and similar to those described for *X. macropus* by Weitzman and Fink (1985:76–77, fig. 73). Fins form umbrella-like canopy when spread. Fins with unpaired bony hooks on ventral surface. Antrorse hooks on distal series of ray segments of all pelvic-fin rays. Terminal distal segment without hooks. Hooks per segment 1 or 2, rarely 3. Anterior ray of cleared and stained male with 19 hooks on 14 segments. Anterior 9 of these with 1 hook per segment and these hooks larger than any other on fin. Ray 2 with 19 hooks on 12 distal segments, ray 3 with 15 hooks on 12 distal segments, ray 4 with 20 hooks on 11 distal segments, ray 5 with 23 hooks on 11 distal segments, ray 6 with 16 hooks on 8 distal segments, and ray 7 with 18 hooks on 10 distal segments. Total hooks on pelvic fin of cleared and stained male 130.

Pelvic girdle of males similar to that of male *X. macropus.* See Weitzman and Fink (1985:77, fig. 37A).

Caudal fin with principal rays 10/9 in all specimens. Caudal-fin osteology and myology similar to that of other species of *Xenurobrycon* as described by Weitzman and Fink (1985:77, 81–83, figs. 11, 12, 25, and 47). Rays of dorsal and ventral caudal-fin lobes modified as in *X. macropus* except that ray 18 lacks ventrolaterally projecting bony laminae. Concavity on ventral surface of this ray present. Principal caudal-fin ray 19 (largest ventral undivided ray) not as thickened as in *X. macropus,* Weitzman and Fink (1985:fig. 11).

Hypural skeleton and caudal squamation of both males and females similar to that described for *X. macropus* by Weitzman and Fink (1985:77, 81–83). Pouch scale, Fig. 3, approximately teardrop-shaped in profile, most like that of *X. heterodon,* Weitzman and Fink (1985:92). Its posterior field pointed and completely bordered by striated radii, not fully free of striae as illustrated for all other species of *Xenurobrycon* by Weitzman and Fink (1985:figs. 28–30). However, pouch scale on right side of 14.3 mm SL specimen of *X. heterodon* with some striae along its posterior pointed border. That of right side, illustrated in Weitzman and Fink (1985:24, fig. 30) with its most posterior border free of striae. Small bilateral caudal-fin hooks present on principal caudal-fin rays 7, 8, 18, 19 of *X. polyancistrus* similar in appearance to those illustrated for *X. macropus* by Weitzman and Fink (1985:fig. 11). As in *X. macropus,* hooks on rays 7 and 8 point distally while those on 18 and 19 antrorse. Rays 7 and 8 with 3 bilaterally paired hooks on ventral branch of distal portion of ray, one pair per segment. Rays 18 and 19 having 5 unpaired hooks per ray. Each hook confined to one ray segment. Hooks

successively alternating in direction, pointing to right or left of vertical plane of fin. Hooks on ray 18, except for one anterior hook, confined to dorsal border of dorsal branch of ray. Ray 19 unbranched and bearing hooks along dorsal border of distal half to one third of fin-ray length. Other species of *Xenurobrycon* with most hooks on ventral lobe rays bilaterally paired but unpaired hook occurring occasionally. No specimens found with hooks alternating, in series pointing right, then left as described for *X. polyancistrus*. Caudal-fin rays 11 and 12 of *X. polyancistrus* interrupted as illustrated for *X. macropus* by Weitzman and Fink (1985:fig. 11) but all other rays continuous.

Scales cycloid with few radii along posterior border except for pouch scale as described above. Lateral line incomplete, perforated scales 3 (3–5, $\bar{x} = 3.8$, n = 12), scales missing in several specimens. Scales in lateral series to caudal base and excluding pouch scale of males, 33 (32–34, $\bar{x} = 32.8$, n = 11). Scale rows between dorsal-fin origin and pelvic-fin origin 8 in all specimens. Scale rows around caudal peduncle 13 in all specimens. Predorsal scales 14 (13–15, $\bar{x} = 14.2$, n = 14); scales lost from specimens from Laguna Santa Rosa.

Teeth of all jaw bones conical, without accessory cusps. Teeth, especially smaller posterior teeth, buried in tissue; counts given below from 2 cleared and stained examples only. Premaxillary teeth 8–9, primarily in one, slightly irregular, wavy row, often 1 or 2 teeth pointing anteriorly. Sometimes these anterior 1 or 2 teeth forming almost separate, anterior row. Maxillary teeth 4 or 5; in one row. Anterior maxillary teeth projecting somewhat anterolaterally while posterior maxillary teeth projecting ventrally. Dentary teeth mostly in one row of 8 (female) to 11 (male) teeth. Usually 1 or 2 teeth placed more ventrally on external surface of anterior portion of dentary ramus. These teeth projecting anterodorsally or anterolaterally in varying degrees. Jaws and teeth very similar to those illustrated for *X. pteropus* by Weitzman and Fink (1985:41, fig. 64B).

Vertebrae 35 (33–35, $\bar{x} = 34.1$, n = 18). Dorsal limb gill rakers 4 (4–5, $\bar{x} = 4.3$, n = 17); ventral limb gill rakers 9 (8–9, $\bar{x} = 8.7$, n = 17). Branchiostegal rays in 2 cleared and stained specimens 4, 3 rays originating from anterior ceratohyal and 1 ray from border between anterior and posterior ceratohyals.

Color in alcohol.—Color pattern similar to that of *X. macropus* described by Weitzman and Fink (1985:83–84). Description from holotype, Figure 1, unless otherwise noted. Body pale brown, nearly white, apparently silvery in life. Narrow dark brown midside stripe extending through center of fourth horizontal scale row counted ventrally from dorsal-fin origin. Stripe interrupted anteriorly and becoming nearly continuous approximately at midregion of body length. Stripe extending from near dorsal portion of opercular opening posteriorly to caudal-fin base. Caudal peduncle with dark brown chromatophores at base of dorsal lobe of caudal fin, forming dark elongate acute mark continuous ventrally with horizontal stripe. Body dorsal to lateral midside stripe with dark brown chromatophores producing reticulate pattern on dorsal body surface. See especially female in Fig. 2. Area ventral to horizontal midside stripe with scattered dark chromatophores. Dark chromatophores along base of anal fin organized into line or stripe. Small scattered dark chromatophores occurring on dorsal, anal, and caudal fins. Pectoral fins hyaline except for some dark brown chromatophores along anterior ray. Pelvic fins of males with dark brown chromatophores denser along anterior rays. Pectoral and pelvic fins of females nearly hyaline.

Opercle, cheek (orbital region), and mandibular area with few dark chromatophores. Dorsum of head in region of supraoccipital, parietal, and posterior frontal bones dark, with many dark brown chromatophores covering area of brain. Head dorsal to eye and area of anterior part of frontal bones

somewhat lighter than posterior area. Nasal area pale, area of premaxilla dark brown.

Sexual dimorphism.—Table 1 presents morphometric data, some arranged by sex and showing sexual dimorphism. Only obvious sexual differences presented. These are same as those presented for *X. macropus, X. pteropus,* and *X. heterodon* by Weitzman and Fink (1985:tables 1–4). Both population samples of *X. polyancistrus* with obvious sexual differences in distance from snout to pelvic-fin origin, depth of caudal peduncle, length of pelvic fin, and length of anterior lobe of anal fin. Hooks present on pelvic, anal, and caudal fins of males; females lack such hooks. Only males have caudal-fin pheromone pump organs and accompanying pouch scale.

Etymology.—The name *polyancistrus* is from the Greek *poly* (many) and *ancistrus* (hook), many hooks, referring to the numerous hooks on the pelvic fin of the male.

Discussion.—The phylogenetic relationship of *X. polyancistrus* appears to be with *X. pteropus,* sharing an apparently derived pattern of large posterior anal-fin hooks in the males and similar jaw teeth. However, the possible derived versus plesiomorphic nature of the teeth has not been determined. The two species differ primarily in the shape of the pouch scale (described in the key above [compare also Fig. 3 with fig. 29 in Weitzman and Fink (1985:23)] and the presence of an adipose fin in *X. pteropus* and its absence in *X. polyancistrus.* Pouch scale shape appears to be constant in species of *Xenurobrycon, Tyttocharax,* and *Scopaeocharax* and was used by Weitzman and Fink (1985) to distinguish both species of *Xenurobrycon* and the genera *Xenurobrycon, Tyttocharax,* and *Scopaeocharax.* The constancy of the presence or absence of an adipose fin is perhaps somewhat less certain. However, some species, both described and undescribed, of the related genus *Tyttocharax* can be distinguished in part by the consistent presence or absence of an adipose fin. Presence or absence of this structure appears constant within species of xenurobryconins. It should be noted that the vague structure that looks like an adipose fin in the photographed female of *Scopaeocharax atopodus* Böhlke in Weitzman and Fink (1985:7) is an artifact. This specimen lacks an adipose fin as do all members of that species that I have examined.

Ecology and distribution.—*Xenurobrycon polyancistrus* was taken from a savannah-like area of the Bolivian Amazon basin. Both localities are tributaries of (Laguna Motacusal) or adjacent to (Laguna Santa Rosa) the Río Mamoré, itself a tributary of the Rio Madeira which flows into the central Amazon River. Laguna Santa Rosa is in a gallery forest enclosing the Río Mamoré. At the time of capture the elongate shallow (to 2.5 m in depth) pond was connected to the Río Mamoré, the water was muddy, the bottom mud and the forest partly submerged. The fish were captured by rotenone from an area averaging 1 meter in depth. The Laguna Motacusal was a depression behind the bank of the Río Isiboro but connected to the river at time of capture. The fish were taken from an area about 5 by 30 meters which averaged nearly a meter in depth. The area was encumbered with macrophytes and dead trees.

The region of capture in relation to other species of *Xenurobrycon* is shown in Fig. 4. The species is isolated from *X. macropus* to the southeast by an independent drainage basin and *X. heterodon* to the northwest by drainage basins isolated by distance and probably ecology. *Xenurobrycon polyancistrus* is "isolated" from *X. pteropus,* its apparent closest relative, by probable differences in ecology (rainforest versus savannah) and/or elevation as well as by distance. Even if *X. polyancistrus* is distributed along the length of the Rio Madeira and its tributaries, the mouth of the Rio Madeira is over 700 kilometers to the east of the single known locality of *X. pteropus,* Fonte Boa on the upper Amazon River. In the Amazon basin certain species of *Tyttocharax* appear

Fig. 4. Map illustrating collecting localities of species of *Xenurobrycon.*

to be isolated perhaps only by ecological factors associated with elevation changes, a situation that may also be true for *Xenurobrycon.*

Supplementary note on Xenurobrycon heterodon *Weitzman and Fink.*—Recently 46 specimens of *Xenurobrycon heterodon,* CAS(SU) 53679, were found in the fish collection at the California Academy of Sciences. These were collected 21 February 1960 (sta no. 3) by George S. Myers and General Thomas D. White from a tributary of the Río Orteguaza at Puerto Lara near Florencia, Caquetá, Colombia. This is a first record of a species of *Xenurobrycon* from Colombia. The specimens are 16.3 to 20.1 mm SL with two adult males at 18.5 and 18.6 mm SL. These two males have well-developed hooks on the anal and pelvic fins only, and the smaller specimen has the hooks somewhat less developed. Eighteen maturing males 16.3 to 17.6 mm are present. The two largest specimens of these have a few very tiny hooks on the first large unbranched ray of the anal fin. All these specimens have a pouch scale and modified caudal musculature and fin rays in various stages of development. There are 23 females or

immatures from 16.5 to 20.1 mm SL. None have ripe eggs but the largest has both ovaries with many developing eggs. Weitzman and Fink (1985:88) reported adults in population samples from Ecuador, Río Bobonaza and Río Napo, as adults from 16.2 to 18.5 mm SL in July 1968 and October 1983 respectively. Adults not exceeding 17.5 mm SL collected in July 1975 were reported by them from the Río Pachitia, Peru. The smaller size at maturity of the samples to the south may be a significant difference among these samples; however, all other characters investigated clearly indicate the Colombian specimens to be *X. heterodon.* Counts and measurements and the morphology of the teeth and pouch scale are like that for *X. heterodon* as reported by Weitzman and Fink (1985:88–93).

Acknowledgments

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